

TOXICITY OF (+)- AND (-)-GOSSYPOL TO *RHIZOCTONIA SOLANI*

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Gossypol occurs as two stable enantiomers due to restricted rotation around the carbon-carbon binaphthyl bond. The biological activities of the enantiomers have consistently been shown to differ in a wide range of bioassays. In almost all bioassays, the (-)-enantiomer has been the more biologically active. Howell and co-workers have shown that the biocontrol agent *Trichoderma virens* induces in cotton seedling roots the biosynthesis of terpenoids, including desoxyhemigossypol, hemigossypol and gossypol. This induction appears to be an essential component in the biocontrol of the seedling pathogen *Rhizoctonia solani*. Of the induced terpenoids, gossypol is the most abundant with concentrations 10-20 times that of hemigossypol or desoxyhemigossypol. The ratio of the (+)-enantiomer to the (-)-enantiomer in cotton seedling roots and their toxicities to *R. solani*, however, had not been investigated. Our study found that the ratio of enantiomers in seedling roots is unequal, with the (+)-enantiomer present at concentrations two to three times that of the (-)-enantiomer. We also determined that the toxicities to *R. solani* of racemic gossypol, and the (+)- and (-)-enantiomers are not significantly different. The ED₅₀ values for the racemate, and the (+)- and (-)-enantiomers of gossypol were found to be 13.00±0.53; 12.38±0.75; and 12.59±1.13, µg ml⁻¹, respectively.